

prominent in extra-tropical cyclones, where the rotational energy is moderate, and the translational velocity great.

The first set of characteristics may conveniently be classed together as the rotational; the second set as the translational phenomena of a cyclone.

Tropical and extra-tropical cyclones are identical in general character, but differ in certain details, due to latitude, surrounding pressure, and to the relative intensity of rotation or translation.

III. "A Thermal Telephone Transmitter." By Prof. GEORGE FORBES. Communicated by LORD RAYLEIGH, D.C.L., Sec. R.S. Received February 12, 1887.

We have had so much evidence of the sensitiveness of the Bell telephone receiver to the minutest changes of current, that we have ceased to be surprised at any transmitter which responds to the sounds of articulate speech. But, in the instrument now shown, it was so extremely unlikely that sensible variations of current could be produced with sufficient rapidity, that even now there is perhaps some interest attached to the experiment. A wooden cylinder was used closed at one end. A saw cut was made across the diameter of the closed end, making a fine slit. In the slit was stretched a platinum wire, 0·001 inch diameter and 2 inches long, with its ends connected by copper wires through the primary of an induction coil to a battery sufficiently powerful to make the platinum wire red hot. On connecting the secondary circuit with a receiving telephone in a distant room and speaking into the wooden cylinder, the words are reproduced and heard in the telephone. Each vibration of air in the slit cools the platinum wire, diminishing its electrical resistance, and increasing the electric current. The words transmitted are not quite perfect, the higher harmonics being wanting. It requires some attention to make out all the words of a sentence. A brass cylinder instead of the wooden one, and a Wollaston platinum wire of excessive fineness have been used without materially altering the clearness of the articulation. Platinum foil has hitherto given no sound of the voice. The slit in the brass instrument is made of glass to prevent the short-circuiting and destruction of the platinum wire.

Wires from one to three inches in length have been used. The longest ones are best. No distinct articulation is heard if the wire be not red hot. The hotter the wire the better is the articulation. An adjustable slit was tried and the narrow slit gave the best results. Mr. Preece some years ago used the expansion and contraction of a fine platinum wire to act on a diaphragm, and so serve

as a receiver. The articulation seems to have been about the same in quality as when the new transmitter is used with a Bell receiver. These new experiments bear out all that Mr. Preece said about the rapidity of variation of temperature which can be produced in a fine platinum wire. They may also be perhaps of some interest from other points of view; but they are not likely to lead to any results of practical importance. It is probable from the theory of the instrument that the tones are raised an octave, as is also the case in the Preece receiver.

*Presents, February 24, 1887.*

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